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SpaceLogger®.S10

User Manual

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1 INTRODUCTION

The SpaceLogger®.S10 is designed as a stand-alone data logger for serial data logging from a wide range of devices and sensors with RS232 output.

SpaceLogger.S10 records samples of data from a single RS232 data source.

Each data record is date & time-stamped. A new file (default format is .CSV) is generated for each day's worth of data.

Data is stored onto an SD card. SD cards with up to 2 GByte capacity are compatible with SpaceLogger. Higher capacity cards are not compatible. SpaceLogger will also accept other compatible data storage cards, such as MMC and MMC mobile.

The SD card can be removed from the logger and inserted into a card reader connected to a PC. Stored data files are accessed in the same way as files on the computer's other disk drives. The text files may be read and manipulated in any standard Office applications (e.g. Notepad or MS Excel).

The SpaceLogger.S10 will also output RS232 data to another device. Refer to section 5.7 for details.

The logger requires a 7 - 30 volt DC supply which can be provided by an AC/DC mains adaptor or suitable battery.

Document revision summary

Issue	Date	Description
1	Feb 2012	Original document
2		

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2 QUICK START: EASY STEPS TO DATA LOGGING

❶	Connect RS232 inputs	see section 4
❷	Set up logging preferences with SETUP.TXT file	see section 5
❸	Power on	see section 4.6
❹	Set time and date	see section 5.1
❺	Insert SD card	see section 6.1
❻	Start recording data	see section 6.2
❼	🕛 🕐 🕑 🕒 🕓 🕔 🕕 🕖 🕗 🕘 🕙 🕚	
❽	Stop recording data (press purge button)	see section 6.2
❾	Remove card and transfer to PC to view and analyse data	see section 6.2

3 EXAMPLE APPLICATION

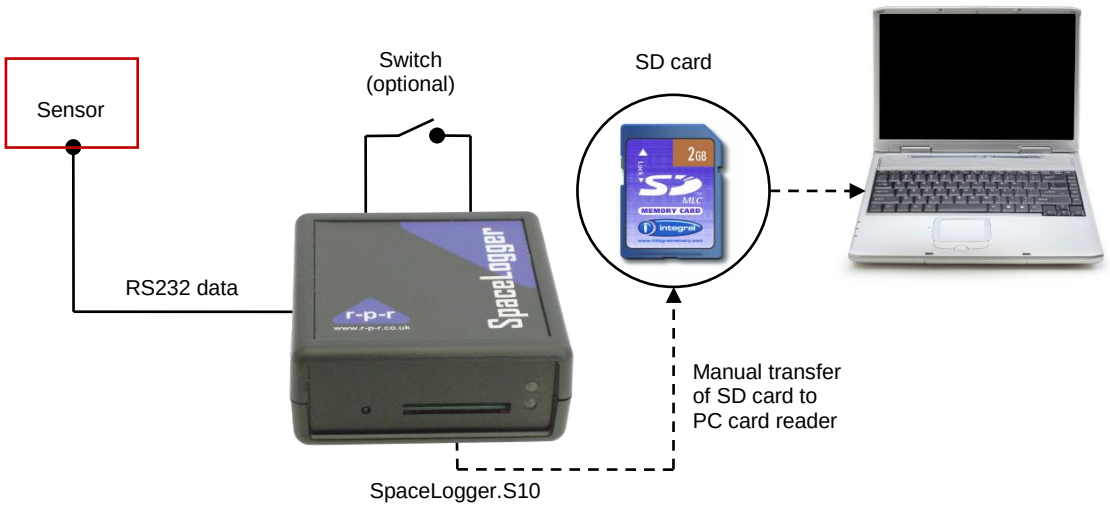

Figure 1

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4 CONNECTING

4.1 Terminal Strip Arrangement

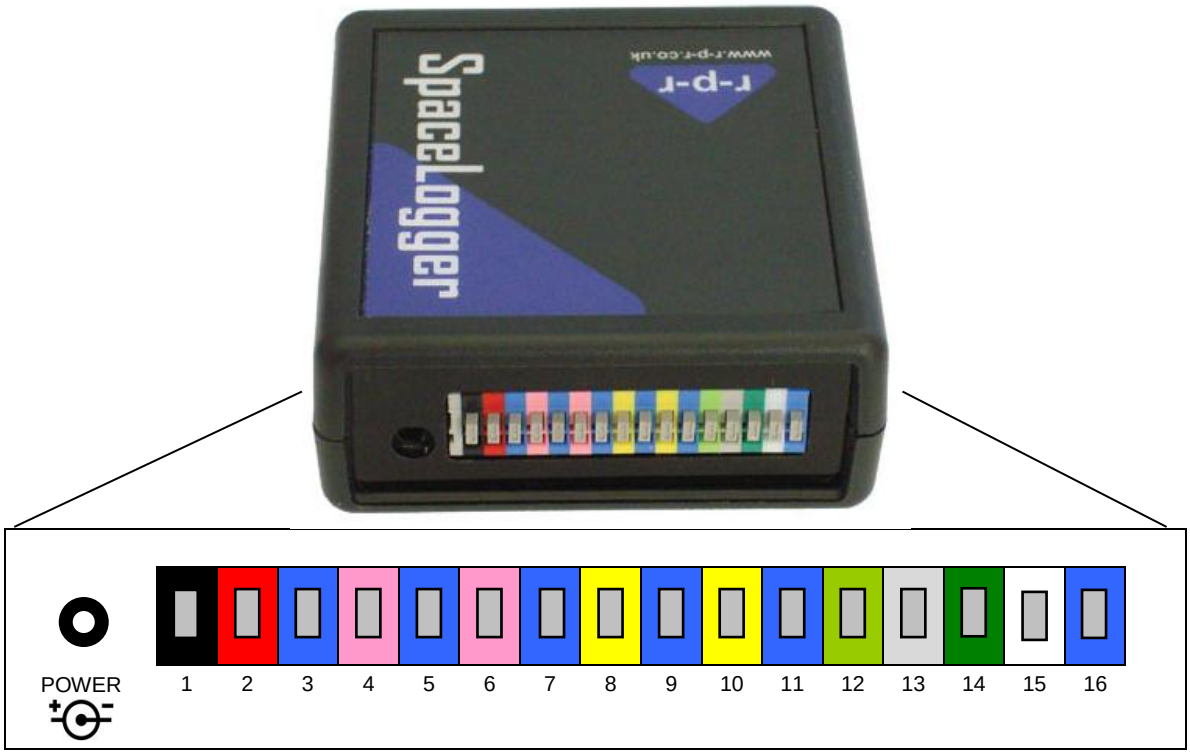

Figure 2

4.2 Generic Terminal Allocations

SpaceLogger Terminal	Signal description	Use
1	Power GND	Power
2	Supply +V (+7 to 30V dc)	
3	Analogue GND 1	Reserved for future options
4	Analogue input 1	
5	Analogue GND 2	
6	Analogue input 2	
7	Switch GND 1	Switch to ground (see section 5.11)
8	Switch input 1	
9	Switch GND 2	Switch to ground (see section 5.11)
10	Switch input 2	
11	GND	RS232 signal output ground (see section 5.7)
12	RS232 Tx 2	Reserved for future options
13	RS232 Rx 2	
14	RS232 output 1	RS232 signal output (see section 5.7)
15	RS232 input 1	RS232 signal input from device/sensor
16	RS232 GND 1	

Table 1

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4.3 RS232 Interface

Connection to the RS232 serial data source should be made as per Table 1. This table should be read in conjunction with Figure 2. Wires should be prepared as per section 4.5.

4.4 Switch inputs

The status of two switches connected between terminals 7 and 8 and terminals 9 and 10 can be added to the logged data. Details of how this is activated are given in the SWITCH command section 5.11.

Figure 3 shows the input circuit for one of the switch inputs.

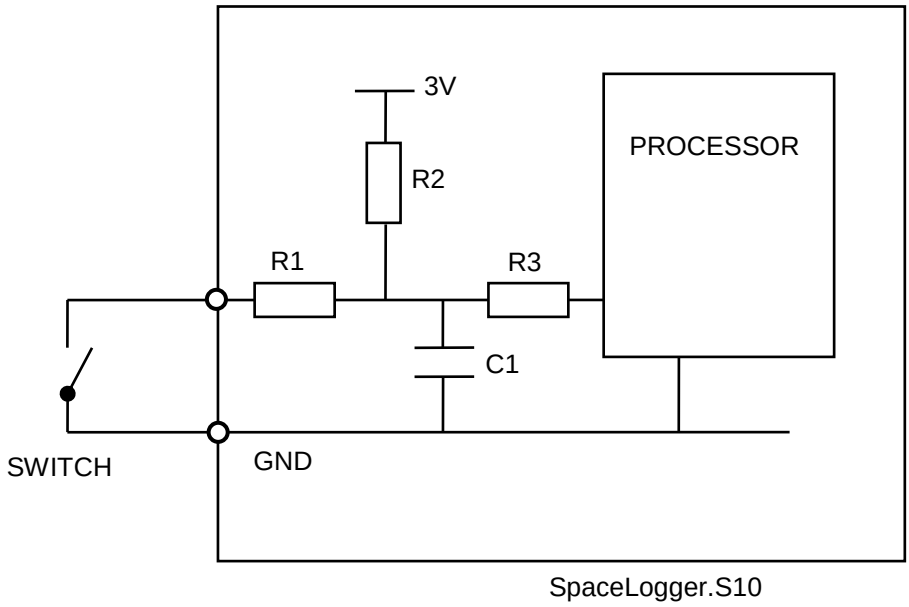

Figure 3

Note if it is required to drive a switch input directly from the user's circuit the input signal must not exceed 3 volts.

4.5 Cable Preparation

The logger uses screwless terminals and to ease connection, wires should be prepared as per Figure 4. It is important that the stripped ends be accurately 9 to 10mm long to ensure good connections in the terminals.

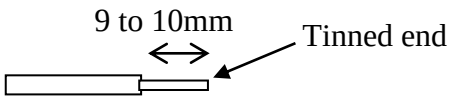

Figure 4

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Either solid or stranded cable is acceptable, in the range 0.32 to 0.65 mm diameter (AWG 28 to 22) with gauge 24 being ideal.

Using a small flat headed screw-driver fully depress the grey plunger for the required terminal and insert the wire as far as it will go, into the hole below the plunger. Release the grey plunger and the wire is held captive by the connector. A gentle tug on the wire will confirm that it is held firmly.

If the wire in question is multi-strand, ensure that all strands are inserted in the terminal hole.

Please note that interconnection of all components should be completed prior to applying power.

4.6 Power Supply

When the logger is powered using a 7 to 30 V DC supply the central pin on the power socket should be to GND.

Alternatively, power may be supplied via terminals 1 (black) and 2 (red) on the screwless terminal connector strip, as per Table 1. Note that if power is supplied via the supply socket then terminal 2 (red) is automatically disconnected.

Warning: All GNDs are common and so damage to the logger may result if they are connected to different voltages.

5 SETUP FEATURES

The SpaceLogger.S10 settings are customisable using a configuration file named SETUP.TXT written to the SD card.

The following parameters may be modified using defined commands:

- Setting the time & date — See section 5.1
- Start and end characters to define each data sample — See section 5.2
- Baud rate of RS232 input/output — See section 5.3
- Logging interval/sample rate — See section 5.4
- File name format for the recorded data — See section 5.5
- Time-stamping — See section 5.6
- RS232 data output — See section 5.7
- Data sampling — See section 5.8
- Handling of unprintable characters — See section 5.9
- Output of a file's content on start-up — See section 5.10
- Logging of switch status on Digital I/O channels — See section 5.11

Refer to the sections below for command details and section 5.13 for how to create the SETUP.TXT file.

Please refer to Appendix A1 for full list of commands and the valid inputs for their values and the default settings.

5.1 Setting the time & date

To set the time and date for correct stamping of the data records, a file named SETUP.TXT must be created on the SD card. This file is read by the SpaceLogger when the card is inserted into the logger and the clock synchronised to the given time when the button to the left of the card slot is pressed.

Steps to set the time and date:

1. Insert SD card into card reader attached to USB port of PC (or use integrated card reader if the PC has one).

2. Open notepad or similar text editor and type the following three lines:

   WAIT
   TIME=hh:mm:ss
   DATE=DD/MM/YYYY

   Where hh:mm:ss is the time in, say, a couple of minutes and DD/MM/YYYY is today's date.

3. Save this text file as **SETUP.TXT** on the SD card in the **root folder**. (Note: if folder DATA already exists on the card, ensure the file SETUP.TXT is not in this folder but at the top level in the root directory). If using Windows and Vista, please refer to section below.

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4. Remove card from card reader and, with the power on, insert the card into the SpaceLogger. Both the red and green LEDs will come on.

5. At the time saved in the SETUP.TXT file, press the button to the left of the card slot. The SpaceLogger will 'Beep' once and both LED's switch off. Release the button. The red LED may flicker on and off after this and once the card has completed its initialisation the green LED will come back on and remain on.

6. After updating the time and date, the SpaceLogger renames the file SETUP.TXT to SETUPOLD.TXT to avoid unintentionally repeating the commands next time the unit is switched on or the card re-inserted.

The SpaceLogger has an internal battery to maintain the time and date when the power to the unit is switched off. When it is necessary to reset the time and date, please repeat the steps outlined above.

If no time and date is set up on the SpaceLogger, the unit will emit a warning 'Beep' four times a minute as a reminder.

5.2 To Define the Data Sample to be Recorded

The SpaceLogger.S10 is capable of being used with any sensors that output their information in ASCII sentences. The format of the data must be 8 bits and no parity. It is also a requirement that each data record has identifying start and end characters to define the data sequence to be sampled.

The start and end characters may be defined in one of two ways:

a) Single Unique Start and End Characters:

This method requires a single unique identifying start character and a different identifying end character. The SpaceLogger.S10 only records the ASCII characters between these start and end characters.

The SpaceLogger.S10's default start character is <STX> (2) and end character is <LF> (10).

The SpaceLogger.S10 may be set to recognise any other start and end characters using the following SETUP.TXT command lines:

STX=s
ETX=e

Where:

s is the decimal value (0-255) of the ASCII character that indicates the start of the data string that is to be stored. Default value is 2. *

And,

e is decimal value (0-255) of the ASCII character that indicates the end of the data string that is to be stored. Default value 10. *

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Note:
The start (STX) character is replaced by the date and time when the data is logged.

* For table of ASCII characters and their decimal values, refer to the Appendix A2.

b) Start String and Single End Character:

Alternatively, a string of up to 15 characters may be specified for identifying the start of the data to be recorded.

The procedure to set up the SpaceLogger.S10 to recognise the start and end identifiers is as described above, but in this case:

STX="aaaaaaaaaaaaaaa"

Where:
aaaaaaaaaaaaaaa is a string of up to 15 ASCII characters.

Note:
- The string is case sensitive.
- Question marks (?) may be used to denote any character i.e. as wildcards.

When the string is defined as more than one character long it will be recorded by the SpaceLogger.S10 with the rest of the sampled data stream. If the start string consists of only one character, it will not be recorded but replaced by the time and date as for STX=s method above.

Example:
If the logger was required to record the position from a GPS every 10 seconds, the following could be specified to record every 10th RMC sentence of an NMEA data stream:

STX="$??RMC,?????0"

A table of ASCII characters and their decimal values is included in the Appendix A2.

5.3 To Set the Baud Rate

The default baud rate is 9600 bits per second. If an alternative baud rate is required the following SETUP.TXT command line may be used:

BAUD=b

Where b is the baud rate.

Valid baud rates are 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200, 300 and 110 bits per second.

5.4 To Select a Logging Interval

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By default, the SpaceLogger.S10 will record every sample output by the attached sensor.

If an alternative logging interval is required, the SpaceLogger.S10 may be set to record at a less frequent sample rate by using the following SETUP.TXT command line:

RATE=r

Where r is the time in seconds between sampling for the STX condition, as an integer.
Note:

- r = 0 to 60
- r should be set to a value greater than the sensor output interval or 0
- If r = 0, every sample received by the SpaceLogger will be recorded – i.e. the SpaceLogger looks for the next STX condition immediately after the ETX condition is detected.

5.5 To Customise File Names

SpaceLogger.S10 creates a folder **DATA** on the SD card root folder. Data files are written to this folder. A new file is generated each day.

The default file name for each day's data is 20YYMMDD.CSV where YYMMDD is that day's date.

This may be customised to the format ffYYMMDD.nnn by using the following SETUP.TXT command line:

FILE=ff.nnn

Where:
ff is a pair of ASCII characters that set the start of the file name. Default characters are 20.
And,
nnn are the ASCII character that set the file extension. Default characters are CSV.
Note:

- Lower case characters are converted to upper case characters so will not be differentiated.
- Question marks (?) may be used to denote a space.

The stored file name will now take the format:

ffYYMMDD.nnn

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5.6 To Disable the Time-Stamp

The date and time-stamping of data by the SpaceLogger.S10 may be switched off by using the following SETUP.TXT command line:

TIMESTAMP=t

Where t = Y or N

- If **TIMESTAMP=Y**, on detection of the start of the sample the date & time stamp will be inserted into the stored data
- If **TIMESTAMP=N**, data will not be date & time stamped

5.7 To Output RS232 Data from the SpaceLogger.S10

RS232 data may be output in two forms from the SpaceLogger. There is the option to output data exactly as it is received by the SpaceLogger from the attached sensor, or the option to output the data in the format it is written to the log file on the memory card.

The wiring connections for RS232 output are as described in Section 4.2 – to terminal 11 (blue) GND and terminal 14 (green) RS232 Output 1.

The baud rate of the output data stream is as per the data received, i.e. default 9600 baud or as selected per Section 5.2.

RS232 data output from the SpaecLogger.S10 is enabled by using the following SETUP.TXT command line:

OUTPUT=o

- If o = **I**, the data input on the RS232 input (Rx) is output on the RS232 output (Tx)
- If o = **L**, the data as written to the log file on the memory card is output on the RS232 output (Tx)
- If o = **N**, no data will be output

Please note that the SpaceLogger model, software version and time & date are also output on powering on.

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5.8 To Record all Data (Disable Sampling)

It is possible to disable the sampling function of the SpaceLogger.S10 and to record all data that is received on the RS232 input.

In order to disable the data sampling i.e. the detection of the STX and ETX, the following SETUP.TXT command line is required:

LOG_ALL=a

- If a = **Y**, detection of STX and ETX will be disabled and all data logged [Note that the time/date stamp and switch status will not be inserted into the logged data]
- If a = **N**, only data between STX and ETX will be logged, where STX and ETX are defined by the STX and ETX commands

5.9 To Record Unprintable ASCII Characters

By default, to ensure logged data can be easily read with Microsoft notepad, any un-printable characters with an ASCII value less than 10 [0x00 to 0xff] are converted to a space character <SP>.

To disable this modification of the data, the following SETUP.TXT command line is required:

RAW=w

- If w = **Y**, all characters with values 0 to 255 will be logged
- If w = **N**, characters with a value less than 10 will be logged as a space character <SP>

5.10 To Output a File's Content to RS232 Output on Card Initialisation

Should it be useful to output a command line to the RS232 Output 1, for example to start the output of data from a sensor, it is possible to write this command line to a file called STARTUP.TXT. This content of this file may be set to output each time the SD card is initialised.

To enable output of file STARTUP.TXT, the following SETUP.TXT command line is available:

STARTUP=u

- If u = **Y**, the content of file STARTUP.TXT will be output on the RS232 Output 1 each time the memory card is initialised.
- If u = **N**, STARTUP.TXT will not be output

Note:

- File STARTUP.TXT must be located in the root directory on the card.
- File STARTUP.TXT may contain any characters with values 0 to 255
- The data contained in file STARTUP.TXT is not recorded by the SpaceLogger

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5.11 To Record the Status of the Digital Input Channels

It is possible to record the status of switches connected to the 2 digital I/O terminals. To enable recording of the switch status, the following SETUP.TXT command line may be used:

SWITCH=c

- If c = **Y**, the specified ETX character is replaced by:
  ,s8,s10<CR><LF>
- If c = **N**, the switch status is not logged

Where:

- s8 is the status of the switch to ground connected to terminal 8
- s10 is the status of the switch to ground connected to terminal 10
- s8 and s10 are 0 if the switch is open and 1 if the switch is closed

Refer to section 4.2 for details of connecting the digital I/O terminals.

5.12 Resetting the SpaceLogger.S10 to Default Settings

To intentionally return to the default settings, create a new SETUP.TXT file containing the command line:

RESET

RESET loads the following default settings:

STX=2
ETX=10
BAUD=9600
RATE=0
FILE=20.CSV
TIMESTAMP=Y
OUTPUT=N
LOG_ALL=N
RAW=N
STARTUP=N
SWITCH=N

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5.13 SETUP.TXT file

The SETUP.TXT file is created as follows:

1. Insert SD card into card reader attached to USB port of PC (or use integrated card reader if the PC has one).

2. Open notepad or similar text editor and type the required command line or lines. Refer to sections above for explanation of commands.

3. Commands may be typed in upper or lower case but they will be converted to upper case before execution.

4. The SETUP.TXT file may contain a list of commands. For example, to set up all available parameters, the file SETUP.TXT should contain the following lines:

   WAIT
   TIME=hh:mm:ss
   DATE=DD/MM/YYYY
   STX=s
   ETX=e
   BAUD=b
   RATE=r
   FILE=ff.nnn
   TIMESTAMP=t
   OUTPUT=o
   LOG_ALL=a
   RAW=w
   STARTUP=u
   SWITCH=c

5. Comments may be added to the A10.TXT file using //. The TextLogger will not read any text following // until the end of the line.

6. Save this text file as **SETUP.TXT** on the SD card in the root folder. (Note: if folder DATA already exists on the card, ensure the file SETUP.TXT is not in this folder but at the top level in the root directory.) If using Windows and Vista, please also refer to section 5.14.

7. Remove card from card reader and insert the card into the SpaecLogger.S10.

8. The command lines will now be effective. The configuration is saved to the SpaceLogger.S10 and the file SETUP.TXT is automatically renamed to SETUPOLD.TXT on the memory card. Settings are stored in eeprom and are preserved when power is switched off.

9. To intentionally return to the default settings, a new SETUP.TXT file must be created containing the command **RESET**

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5.14 Notes on saving file SETUP.TXT

File SETUP.TXT must have its name and file extension in capitals, e.g. not SETUP.txt.

To ensure saving correctly from Notepad or similar text editor, select ‘Save As...’. When the Save As box appears, select ‘All Files’ from the pull down list next to ‘Save as type:’ and type SETUP.TXT in the File name box.

With Windows and Vista it is beneficial to have File Extensions visible when viewing documents in Explorer.

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6 LOGGING

Figure 5

6.1 SD Card

Once the time and date have been set on the SpaceLogger; when the SD card is next inserted correctly into the SpaceLogger (with power supplied), the unit should 'Beep' once and the red LED blink as the card initialises. At this stage, the SpaceLogger's internal buffer is cleared and is ready to start receiving new data from the connected equipment.

The length of time the memory card takes to initialise will depend on the formatting of the card and the amount of data already stored on it.

The green LED will then switch on indicating that the unit is 'Ready to Record Data'. The green LED will remain on while the unit is in this state.

The SD card is designed to fit easily into the card slot one way only. Do not bend the card or force it into the slot.

SpaceLogger is compatible with SD cards up to 2GB capacity but not SDHC cards. MMC and MMC mobile cards up to 2GB capacity are also compatible.

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6.2 Data Transfer

Received data is stored temporarily in a buffer (1024 bytes). The SpaceLogger inserts the time and date at the start of each data record. Data is transferred from the buffer to the SD card in 512 byte packages.

If no data has been received from the data source for a set time period (a time equal to twice the selected logging rate plus 12 seconds), any remaining data in the buffer is written to the SD card.

The red LED blinks each time data is written to the card.

The SD card should not be removed while data is being written to it. To stop recording data, the small button to the left of the card slot on the front of the SpaceLogger should be depressed. There will be an audio signal to indicate that the button has been pressed. This action will also purge any data in the buffer to the SD card so the card is ready to be removed from the SpaceLogger. The green LED will automatically switch off to indicate that the unit is no longer enabled to record further data.

To recommence data logging the power must be cycled or a card re-inserted in order to re-initialise the card. The green LED will again indicate the unit as 'Ready to Record Data'.

To avoid losing data or corrupting the card, never remove the card or disconnect the power supply when the red LED is flashing or blinking.

When the memory card becomes full the SpaceLogger will stop logging data; it will not overwrite files already saved.

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7 SPACELOGGER.S10 SPECIFICATION

Physical	Dimensions	Width: 67 mm Depth: 67 mm Height: 28 mm (excluding optional rubber feet)
	Weight	75g
	Enclosure material	GP ABS (UL94-HB) plastic and acrylic
Input / Output Capability	Transmission standard	RS232 compatible, 8 bits and no parity
	Transmission speed	9600 Baud (default) or selectable from 115200, 57600, 38400, 19200, 4800, 2400, 1200, 300 or 110 Baud
	Wire acceptance	0.32 to 0.65 mm diameter (AWG 28 to 22)
Switch Inputs	Max input voltage	Must not exceed 3V
	Current out	7µA max
Data Storage	Data Storage Card	Removable SD, MMC or MMC mobile card
	Data Capacity	2 Gbyte (max)
	File System	FAT16 or FAT32 with 8.3 file names Sector size 512 Bytes
	Data Sample	Records only the data between specified start (STX) and end (ETX) characters
	Data logging interval	Default is to log every data sample output by the device/sensor or select logging interval from 1 to 60 seconds
Audible / Visual Indicators	LED Indicators	Green: Ready to record data Red: Writing data to SD card
	Audio Bleeper	Two tone signal on correct card insertion. Single tone when data purge button depressed. Four bleeps per minute when time & date not set.
Real Time Clock	Accuracy	±40 ppm at 25 ºC
	Backup battery	CR2032
Power	Power requirement	7 to 30 Vdc
	Current at 12Vdc	10 mA typical
	Supply input protection	Polarity reversal protected and internal re-settable fuse – 140 mA
	Connection	1.3 mm centre pin DC connector, or Screwless terminals (0.32 to 0.64 mm, AWG 28 to 22 diameter conductors)
Environmental	Operating Temperature Range	-25 ºC to +70 ºC
	Storage Temperature Range	-40 ºC to +70 ºC
	Enclosure protection	IP203
Guarantee	Period	1 year (refer to Appendix)

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APPENDICES

A1 SETUP.TXT Commands

Command	Description	Valid command inputs	Default value
WAIT	Puts SpaceLogger in 'wait' mode for clock synchronisation	N/A	N/A
TIME	Time at which clock will be synchronised	hh:mm:ss	none
DATE	Date at which clock will be synchronised	DD/MM/YYYY	none
STX	Defines the start character(s) of the data sample to be logged	"aaa….a" – a string of up to 15 ASCII characters. or Decimal value of single ASCII character	2
ETX	Defines the end character of the data sample to be logged	Decimal value of single ASCII character	10
BAUD	Sets baud rate for RS232 data input and output	115200 57600 38400 19200 9600 4800 2400 1200 300 110	9600
RATE	Sets the sample rate/logging interval	0 to 60 (integer)	0
FILE	Modifies file name and extension format	ff.nnn	20.CSV
TIMESTAMP	Switches data & time stamping on or off	Y N	Y
OUTPUT	Controls RS232 output of data to RS232 Output 1	I L N	N
LOG_ALL	Disables sampling of data via STX and ETX commands so that all data is logged	Y N	N
RAW	Controls modification of unprintable characters (those of value <10) to <SP> characters	Y N	N
STARTUP	Controls output of file STARTUP.TXT content to RS232 Output 1	Y N	N
SWITCH	Enables logging of status of switches on Digital I/O terminals	Y N	N
RESET	Returns logger to default settings	N/A	N/A

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A2 ASCII – American Standard Code for Information Interchange

Value	Hex	Character
0	00H	NUL
1	01H	SOH
2	02H	STX
3	03H	ETX
4	04H	EOT
5	05H	ENQ
6	06H	ACK
7	07H	BEL
8	08H	BS
9	09H	HT
10	0AH	LF
11	0BH	VT
12	0CH	FF
13	0DH	CR
14	0EH	SO
15	0FH	SI

Value	Hex	Character
16	10H	DLE
17	11H	DC1
18	12H	DC2
19	13H	DC3
20	14H	DC4
21	15H	NAK
22	16H	SYN
23	17H	ETB
24	18H	CAN
25	19H	EM
26	1AH	SUB
27	1BH	ESC
28	1CH	FS
29	1DH	GS
30	1EH	RS
31	1FH	US

Value	Hex	Character
32	20H	SP
33	21H	!
34	22H	"
35	23H	#
36	24H	$
37	25H	%
38	26H	&
39	27H	'
40	28H	(
41	29H	)
42	2AH	*
43	2BH	+
44	2CH	,
45	2DH	-
46	2EH	.
47	2FH	/

Value	Hex	Character
48	30H	0
49	31H	1
50	32H	2
51	33H	3
52	34H	4
53	35H	5
54	36H	6
55	37H	7
56	38H	8
57	39H	9
58	3AH	:
59	3BH	;
60	3CH	<
61	3DH	=
62	3EH	>
63	3FH	?

Value	Hex	Character
64	40H	@
65	41H	A
66	42H	B
67	43H	C
68	44H	D
69	45H	E
70	46H	F
71	47H	G
72	48H	H
73	49H	I
74	4AH	J
75	4BH	K
76	4CH	L
77	4DH	M
78	4EH	N
79	4FH	O

Value	Hex	Character
80	50H	P
81	51H	Q
82	52H	R
83	53H	S
84	54H	T
85	55H	U
86	56H	V
87	57H	W
88	58H	X
89	59H	Y
90	5AH	Z
91	5BH	[
92	5CH	\
93	5DH	]
94	5EH	^
95	5FH	_

Value	Hex	Character
96	60H	`
97	61H	a
98	62H	b
99	63H	c
100	64H	d
101	65H	e
102	66H	f
103	67H	g
104	68H	h
105	69H	i
106	6AH	j
107	6BH	k
108	6CH	l
109	6DH	m
110	6EH	n
111	6FH	o

Value	Hex	Character
112	70H	p
113	71H	q
114	72H	r
115	73H	s
116	74H	t
117	75H	u
118	76H	v
119	77H	w
120	78H	x
121	79H	y
122	7AH	z
123	7BH	{
124	7CH	|
125	7DH	}
126	7EH	~
127	7FH	DEL

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A3 Guarantee

System components are warranted for a period of twelve (12) months from the original date of purchase, against defective materials and workmanship. In the event that warranty service is required, please contact Richard Paul Russell Ltd.

This warranty is only valid if, when warranty service is required, a full description of the fault is provided and presented with the original invoice, and the serial number(s) on the component has not been defaced.

Richard Paul Russell Ltd's liability is limited to items of its own manufacture, and it does not accept liability for any loss resulting from the operation or interpretation of the results from this equipment.

This warranty covers none of the following:

- Periodic check ups, maintenance and repair or replacement of parts due to normal wear and tear.
- Cost relating to transport, removal, or installation of the component.
- Misuse, including failure to use the component for its normal purpose or incorrect installation.
- Damage caused by Lightning, Water, Fire, Acts of God, War, Public Disturbances, incorrect supply voltage or any other cause beyond the control of Richard Paul Russell Ltd.
- Units which have been repaired or units altered by a party other than Richard Paul Russell Ltd's employees or agents without prior written consent from Richard Paul Russell Ltd.

In no event shall Richard Paul Russell Ltd be liable under any circumstances for any direct, indirect or consequential damages, any financial loss or any lost data contained in any product (including any returned product), regardless of the cause of loss. Richard Paul Russell Ltd products are not warranted to operate without failure. Richard Paul Russell Ltd's products must not be used in life support systems or other application where failure could threaten injury or life.

The Customers statutory rights are not affected by this warranty. Unless there is national legislation to the contrary, the rights under this warranty are the customer's sole rights and Richard Paul Russell Ltd shall not be liable for indirect or consequential loss or damage to any other related equipment or material.

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A4 Electromagnetic Conformity

EC DECLARATION OF CONFORMITY
ACCORDING TO COUNCIL DIRECTIVE
2004/108/EC

We, Richard Paul Russell Limited of New Harbour Building
Bath Road
Lymington
Hampshire SO41 3SE
United Kingdom

Declare under our sole responsibility that the product:

SpaceLogger-RS

Manufactured by: Richard Paul Russell Limited

to which this declaration relates, is in conformity with the protection requirements of Council Directive 2004/108/EC on the approximation of the laws relating to electromagnetic compatibility.

This Declaration of Conformity is based upon compliance of the product with the following harmonised standards:

Emissions EN 61326:2006

Immunity EN 61326:2006

Signed by: R.P.Russell

Richard Paul Russell – Director

Date of Issue: 3 August 2009

Place of Issue Richard Paul Russell Limited
New Harbour Building, Bath Road
Lymington SO41 3SE, UK

CE

SpaceLogger has been tested for compliance with FCC standards FCC/CFR 47: Part 15:2004. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
The user is cautioned that changes or modifications not approved by the responsible party could void the user's authority to operate the equipment, in line with the FCC guidelines.

A5 WEEE (Waste, Electrical and Electronic Equipment) Statement

The WEEE directive places an obligation on all EU-based manufacturers and importers to take-back electronic products at the end of their useful life. Richard Paul Russell Ltd accepts its responsibility to finance the cost of treatment and recovery of redundant WEEE in accordance with the specific WEEE recycling requirements.
This symbol on the product or on its packaging indicates that the product must NOT be disposed of with normal household waste. Instead, it is the end user's responsibility to dispose of their waste equipment by arranging to return it to a designated collection point for the recycling of WEEE. By separating and recycling waste equipment at the time of disposal, natural resources will be conserved and it will be ensured that the equipment is recycled in a manner that protects human health and the environment. For more information about where you can send your waste equipment for recycling, please contact your local council office or visit our website www.r-p-r.co.uk.

A6 RoHS Statement
(The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2006)

SpaceLogger has been designed to comply with EU Directive 2002/95/EC on RoHS regulations that came into force on 1 July 2006. The unit is assembled from compliant components.
RoHS is often referred to as the lead-free directive, but it restricts the use of the following six substances:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

PBB and PBDE are flame retardants used in some plastics.

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